

CLAIMS

1. An engine oil pump assembly comprising:
 - a housing defining an interior cavity and including a common inlet and first and second outlets;
 - a shaft extending longitudinally through the housing and having
 - an external drive;
 - a first pump mechanism driven by the shaft and communicating with the common inlet and the first outlet of the housing;
 - a second pump mechanism driven by the shaft and communicating with the common inlet and the second outlet of the housing;
 - a first pressure relief valve connected to receive oil from the first pump mechanism and to limit pressure to the first outlet by discharging excess oil flow to a common reservoir;
 - a second pressure relief valve connected to receive oil from the second pump mechanism and to limit pressure to the second outlet by discharging excess oil flow to the common reservoir; and
 - the common reservoir connected to supply supplemental inlet oil to the first and second oil supply mechanisms.
2. An oil pump assembly as in claim 1 wherein the first pump mechanism is advanced in relation to the second pump mechanism to reduce pulsation.
3. An oil pump assembly as in claim 1 wherein oil flow between the common inlet of the housing and the first pump mechanism is restricted.
4. An oil pump assembly as in claim 3 wherein the common reservoir supplies additional oil flow to the first pump mechanism.

5. An oil pump assembly as in claim 3 wherein the common reservoir supplies additional oil flow to the second pump mechanism.

6. An oil pump assembly as in claim 1 wherein the oil pump mechanisms are gerotors.

7. An oil pump assembly as in claim 1 wherein the first and second outlets each discharge oil to an independent oil circuit.

8. An oil pump assembly as in claim 7 wherein the first outlet supplies oil to an engine main bearing gallery.

9. An oil pump assembly as in claim 7 wherein the second outlet supplies oil to an engine cam gallery.

10. A method of operating a dual oil supply pump assembly, comprising the steps of:

5 providing an oil pump assembly including a housing defining an interior cavity and including a common inlet and first and second outlets, a shaft extending longitudinally through the housing and having an external drive, a first pump mechanism driven by the shaft and communicating with the common inlet and the first outlet of the housing, a second pump mechanism driven by the shaft and communicating with the common inlet and the second outlet of the housing, a first pressure relief valve connected to receive oil from the first pump mechanism and to limit pressure to the first outlet by discharging excess oil flow to a common reservoir, a second pressure relief valve connected to receive oil from the second pump mechanism and to limit pressure to the second outlet by discharging excess oil flow to a common reservoir and the common reservoir connected to supply oil to the first and second pump mechanisms;

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- rotating the shaft to operate the first and second pump mechanisms;
- drawing oil through the common inlet with the first pump mechanism;
- 20 drawing oil through the common inlet with the second pump mechanism;
- supplying pressurized oil to the first outlet and to the first pressure relief valve with the first pump mechanism, thereby allowing the first pressure relief valve to control oil pressure at the first outlet by
- 25 discharging a portion of the oil to the common reservoir;
- supplying pressurized oil to the second outlet and to the second pressure relief valve with the second pump mechanism, thereby allowing the second pressure relief valve to control oil pressure at the second outlet by discharging a portion of the oil to the common reservoir; and
- 30 supplying the pump mechanisms with supplemental inlet oil from the common reservoir.

11. A method as in claim 10 including reducing flow pulsations through the pump assembly by advancing the phase of the first pump mechanism in relation to that of the second pump mechanism.

12. A method as in claim 10 including providing increased flow from one of the pump mechanisms to supply additional oil to the common reservoir to provide additional supplemental inlet oil for the other pump mechanism.